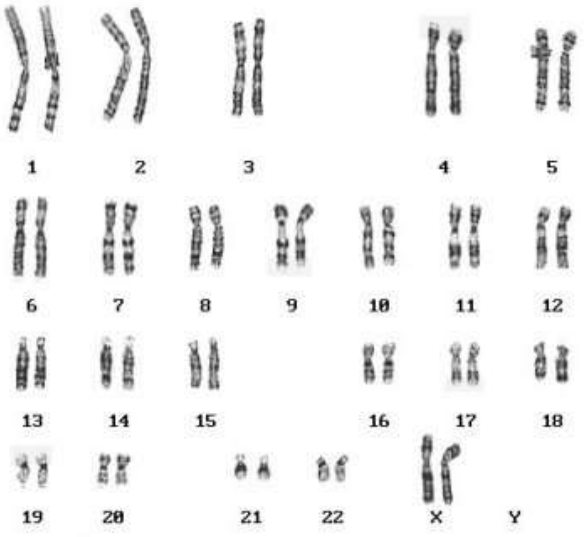
Cancer & the Cell Cycle

Most cancers are caused by a loss of control of the cell cycle leading to uncontrolled or abnormal cell growth. One way to determine why cancer has occurred is by looking at an image of chromosomes, a **karyotype**. Figure 1 below shows a normal karyotype (A) vs. an abnormal karyotype (B).

Figure 1:

A



B

Source: Genetics Department, Affiliated Laboratories, Inc., Bangor, Maine

1. What is the obvious difference between the normal and cancerous karyotype?

2. Suggest 2 ways in which these changes may lead to cancer.

Case Study Assignment – 40 points

1. Go to the AP Biology wikispace (www.nahsapbio.wikispaces.com). Go to Unit 3, bottom of the page, to find the 2 links.

- The link "Ben's Leukemia" is a wikispace showing some details about an Australian boy diagnosed with CML. Review the site to see more information about CML (Ben's Karyotype) and research CML more independently if you need to.
- The link "FDA-Gleevec" is a PDF file showing the drug facts for the medication Gleevec, which was one of Ben's treatments and continues to be a treatment for adult CML. Review the first few pages for the basic information on what the drug is, and more importantly, how it **works** to stop the cancer.

2. Generate a **brochure** promoting awareness for CML that includes the following:

a) Details of CML:
   a. causes (specific chromosome abnormality) (5 Points)
   b. relationship to the cell cycle (what might go wrong in the cell cycle) (5 Points)
   c. Print or draw photos of a normal karyotype versus the CML karyotype. (5 Points)

b) Details of the drug Gleevec:
   a. how it works (15 Points)
      -be as **SPECIFIC** as possible, not just what the article says. Refer to Chapter 11 in textbook also or look up mechanisms/functions of Tyrosine Kinase Receptors.
   b. why it is a good alternative to traditional cancer therapies (3 Points)
   c. any harmful effects to be aware of (2 Points)

c) Brochure Quality (visual appeal/neatness) (5 points)